Kenai Peninsula Streams and Climate Change

Presented by Sue Mauger, Cook Inletkeeper
Climate Change Adaptation Workshop
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Outline

Identify Potential Impacts to Freshwater Systems

Assess Threats to Local Streams

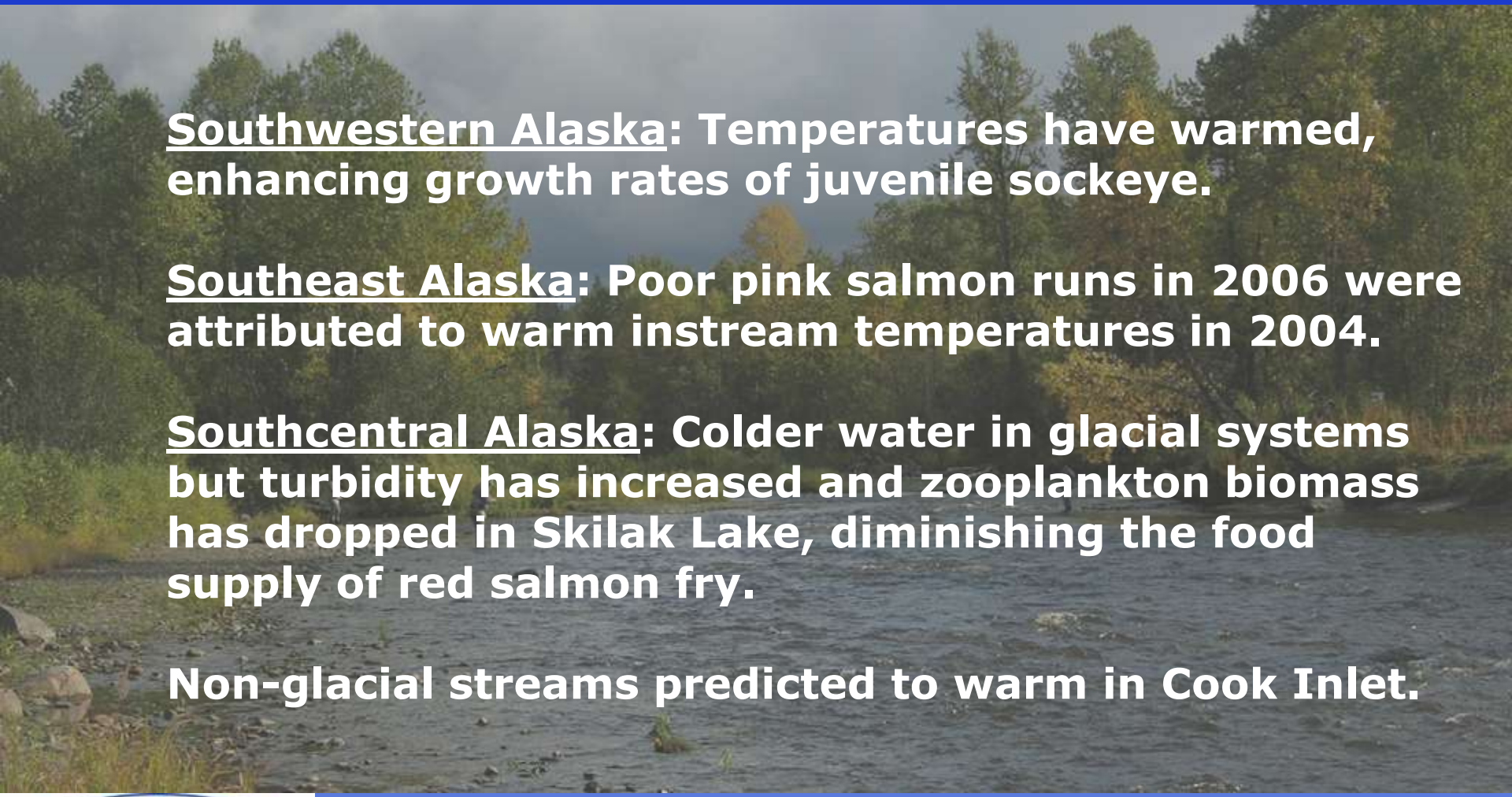
Identify Adaptation Steps to Increase Resilience

Potential Impacts

Changes in air temperature and precipitation patterns will affect:

- **Stream Temperature**
- **Water Volume**
- **Flood Frequency/Intensity**
- **Nutrient Pathways**
- **Invasive Species**

Stream Temperature



Southwestern Alaska: Temperatures have warmed, enhancing growth rates of juvenile sockeye.

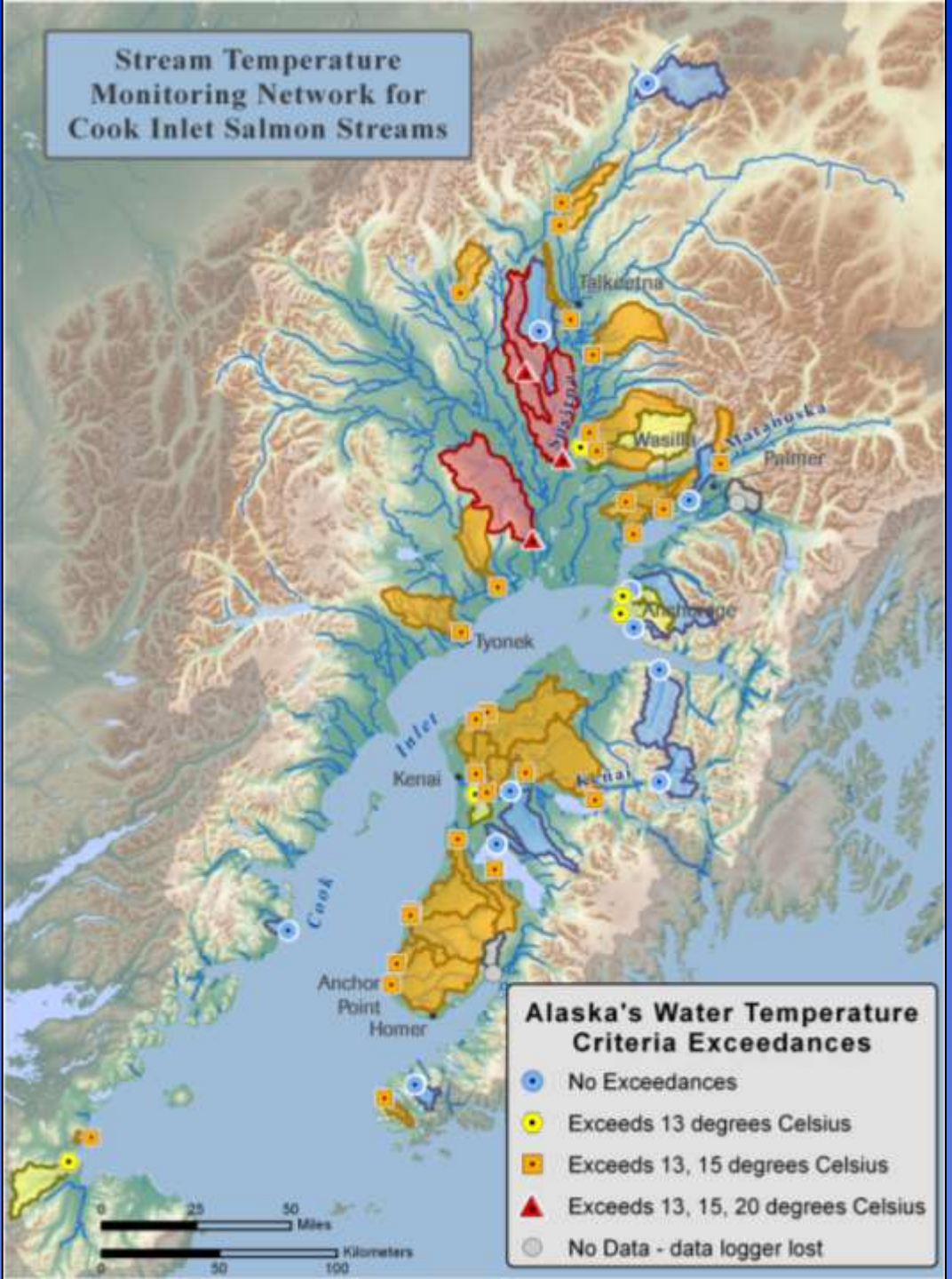
Southeast Alaska: Poor pink salmon runs in 2006 were attributed to warm instream temperatures in 2004.

Southcentral Alaska: Colder water in glacial systems but turbidity has increased and zooplankton biomass has dropped in Skilak Lake, diminishing the food supply of red salmon fry.

Non-glacial streams predicted to warm in Cook Inlet.

Why are warm stream temperatures a concern?

- reduced survivorship of salmon egg and fry;
- reduced growth rates due to increased rates of respiration and metabolism;
- premature smolting and shifts in emigration timing reducing marine survival;
- greater vulnerability to pollution due to increased toxicity of some organic chemicals and metals, including mercury; and
- greater risk of predation and disease.



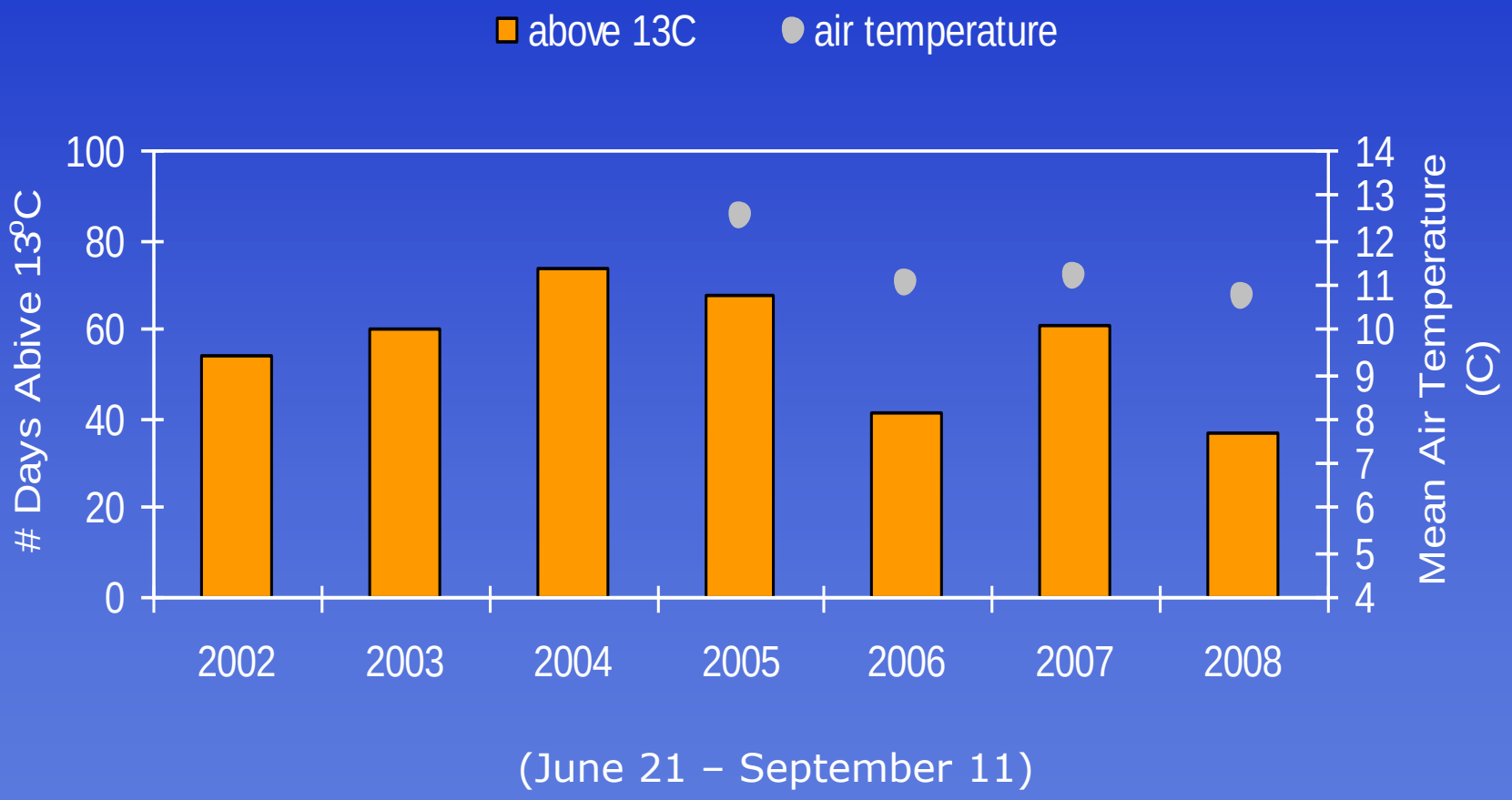
2008 Results
Maximum Temperatures

13°C
(55.5°F)

15°C
(59°F)

20°C
(68°F)

Anchor River



Water Volume

Annual precipitation

predicted increase of 1 inch locally
but with higher air temperatures and increase in evaporation, water availability will not increase

Summer baseflows

decrease summer volume due to less snowpack from higher winter temperatures

Threats

Increase in summer water temperature
Impediment to fish passage

Flood Frequency/Intensity

Increase in flooding events

Changes in flow regimes are predicted but models are not yet refined at regional levels.

Threats

- **infrastructure**
- **egg survival**
- **widening of channels**

100 year flood event on Deep Creek (Oct, 2002)

Nutrient Pathways

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Assess Threats to Local Streams

Adaptation Steps

Reduce Uncertainty and Increase Resiliency!

Increase our knowledge through more directed research on climate change impacts:

- **Collect and incorporate freshwater and marine temperature data, stream flow data and climate information into salmon management models and decision-making**

Generate future scenarios of air temperature and precipitation conditions for the Kenai Peninsula

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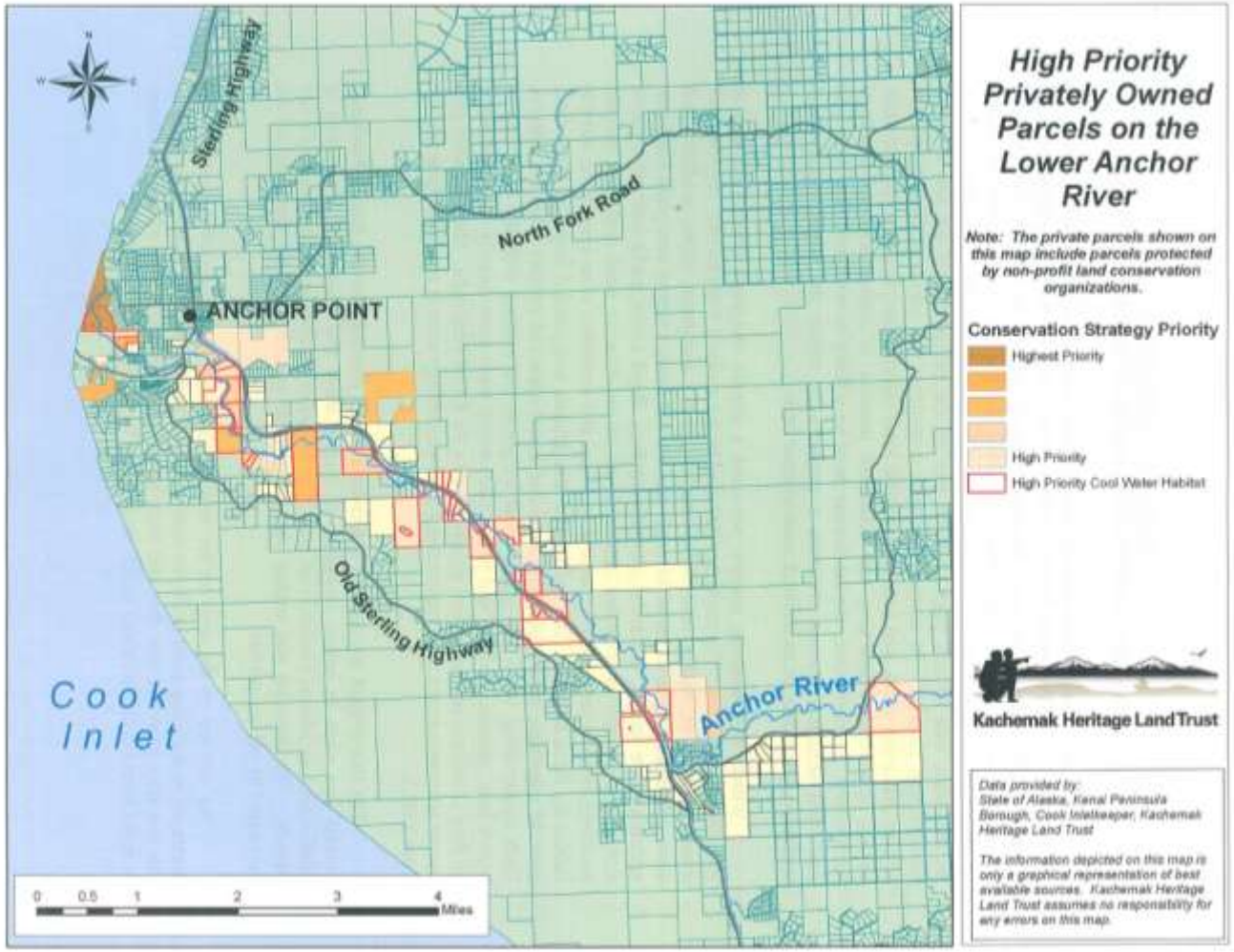
Increase Resiliency

Identify Adaptation Steps to Increase Resilience

Increase Resiliency



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Identify Adaptation Steps to Increase Resilience

Salmon Resiliency

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For more information on the
Stream Temperature Monitoring Network:
www.inletkeeper.org